

**SCOPE OF WORK
FOR THE REMEDIAL DESIGN AND REMEDIAL ACTION
AT THE STAUFFER CHEMICAL/TARPON SPRINGS SUPERFUND SITE**

INTRODUCTION

The purpose of this Remedial Design/Remedial Action (RD/RA) is to design, construct, operate and maintain, monitor, and complete the selected remedy to ensure protection of human health and the environment. Remedial Design (RD) is generally defined as those activities to be undertaken by the Settling Defendant to develop the final plans and specifications, general provisions and special requirements necessary to translate the Record of Decision (ROD) into the remedy to be constructed under the Remedial Action (RA) phase. The RA is generally the implementation phase of site remediation or actual construction of the remedy, including necessary operation and maintenance, and performance monitoring. The RA is based on the RD to achieve the remediation goals specified in the ROD. This Scope of Work (SOW) is designed to provide a framework for conducting the RD/RA activities at this Site and is the "technical" portion of this Consent Decree. This SOW provides for a number of detailed documents which shall be used to guide each component of the RD/RA process at this Site.

The Settling Defendant shall conduct an RD/RA that is in accordance with this SOW and consistent with the Operable Unit 1 Record of Decision (ROD) issued on July 2, 1998, the Superfund Remedial Design and Remedial Action Guidance (U.S. EPA Office of Solid Waste and Emergency Response Directive 9355.0-4A, June 1986) (the "RD/RA Guidance"), and other guidances used by EPA in conducting an RD/RA (a list of the primary guidances is attached), as well as any additional requirements in this Consent Decree. The Settling Defendant shall furnish all necessary personnel, materials, and services needed, or incidental to, performing and completing the RD/RA, including necessary operation and maintenance, and performance monitoring.

EPA shall provide oversight of the Settling Defendant's activities throughout the RD/RA. The Settling Defendant shall support EPA's initiation and conduct of activities related to the implementation of oversight activities. However, the responsibility for conducting an adequate RD/RA to satisfactorily implement the selected remedy shall lie with the Settling Defendant. EPA review and approval of deliverables is a tool to assist this process and to satisfy, in part, EPA's responsibility to provide effective protection of public health, welfare, and the environment. EPA approval of a task or deliverable shall not be construed as a guarantee as to the ultimate adequacy of such task or deliverable. A summary of the major deliverables that Settling Defendant shall submit for the RD/RA is attached.

TASK I - SCOPING

Scoping is the initial planning process of the RD/RA and has been initiated by EPA through this document to determine how the site-specific remediation goals as specified in the ROD will be met. The specific project scope shall be planned by the Settling Defendant and EPA. The Settling Defendant shall document the specific project scope in an RD Work Plan and an RA Work Plan. Because of the unknown nature of the Site, additional data requirements may be identified throughout the RD/RA process. The Settling Defendant shall submit a technical memorandum documenting any need for additional data along with the proposed Data Quality Objectives (DQOs) whenever such requirements are identified. In any event, the Settling Defendant is responsible for fulfilling additional data and analysis needs identified by EPA consistent with the general scope and objectives of the Consent Decree, including this SOW.

The Site Objectives for the Stauffer Chemical/Tarpon Springs Superfund Site (the Site) have been determined preliminarily, based on available information, to be the following:

1. Review of existing information pertaining to the Site. This includes the ROD, the Remedial Investigation/Feasibility Study (RI/FS), and other reports or related information.
2. Review of relevant guidance (see attached references) to understand the RD/RA process. This information shall be used in performing the RD/RA and preparing all deliverables under this SOW.
3. Collection of additional data, as required. This includes additional sampling, geotechnical investigations, surveys, modeling.
4. Performance of bench and pilot Treatability Studies to evaluate and properly design the selected remedy. The Treatability Studies should be utilized to determine the appropriate admixture for the Insitu Solidification/Stabilization process.
5. Preparation of detailed design plans and specifications necessary to construct the selected remedy.
6. Actual implementation of the selected remedy, including construction of facilities necessary to implement the selected remedy.
7. Operation and maintenance of the facilities necessary to implement the selected remedy, as required.

8. Performance monitoring of the selected remedy to ensure all remediation goals are met. These remediation goals are as follows:

Cleanup Standards: Remedial Goals

Soil/Waste Contaminant	Maximum Concentration Detected (mg/kg)	Remedial Cleanup Goals (mg/kg)
Arsenic	127	21.1
Antimony	32.3	28.1
Beryllium	1.6	120
Elemental Phosphorus	0.854	1.4
Thallium	13.4	1.4
Radium-226 (Lead-210)*	73.8 pCi/g	5 pCi/g
Total CPAHs**	—	0.089

* Note that this cleanup level is measured above the background (normal) concentration. The background (normal) concentration will be established during the Remedial Design.

** Total CPAHs include Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenzo(a,h)anthracene, and Indeno(1,2,3-cd)pyrene.

All Cleanup Standards have been derived from the Final Baseline Risk Assessment except for Radium-226 and Beryllium. The standard for Radium-226 has been established in accordance with the relevant and appropriate requirement (Federal Standards for the Cleanup of Land and Buildings Contaminated with Residual Radioactive Material, 40 CFR 192). The Beryllium standard is from Table 2, Soil Cleanup Target Levels contained in FAC 62-777, Contaminant Cleanup Target Levels.

9. Ensuring that all Federal and State applicable or relevant and appropriate requirements (ARARs) are met. These ARARs are specified in the ROD.

10. Completion of the selected remedy to ensure protection of human health and the environment.

The Settling Defendant must meet with EPA to discuss all project planning decisions and special concerns associated with the Site. The following activities shall be performed by the Settling Defendant as a function of the project scoping process.

A. Site Background

The Settling Defendant shall gather and analyze the existing information regarding the Site and shall conduct a visit to the Site to assist in planning the scope of the RD/RA as follows:

1. Collect and Analyze Existing Data and Document the Need for Any Additional Data

Before planning RD/RA activities, all existing Site data shall be thoroughly compiled and reviewed by the Settling Defendant. Specifically, this shall include the ROD, RI/FS, and other available data related to the Site. This information shall be utilized in determining if any additional data is needed for RD/RA implementation. Decisions on the necessary data and Data Quality Objectives (DQOs) shall be made by EPA.

2. Conduct Site Visit

The Settling Defendant shall conduct a visit to the Site with the EPA Remedial Project Manager (RPM) during the project scoping phase to assist in developing a conceptual understanding of the RD/RA requirements for the Site. Information gathered during this visit shall be utilized to better scope the project and to determine the extent of additional data necessary to implement the RD/RA.

B. Project Planning

The Settling Defendant shall meet with EPA regarding the following activities and before proceeding with Task II.

1. Refine the Site Objectives

Whenever necessary, the Settling Defendant shall refine the Site Objectives. Any revised Site Objectives shall be documented in a technical memorandum to be prepared by Settling Defendant and are subject to EPA approval prior to proceeding with Task II.

2. Document the Need for Treatability Studies

Treatability Studies shall be conducted by the Settling Defendant to insure that the selected remedy will attain all applicable or relevant and appropriate requirements (ARARs) as well as any other treatment requirements outlined in the ROD. Treatability Studies shall be required except where the Settling Defendant can demonstrate to EPA's satisfaction that they are not needed. The study results and operating conditions shall be used in the detailed design of the selected remedy. Where Treatability Studies are needed, Treatability Study activities shall be planned to occur concurrently with additional data collection activities (see Task II).

3. Evaluate Treatability Studies

Where Treatability Studies are required, the Respondents shall propose and EPA shall approve the type of Treatability Studies to be used (e.g., bench versus pilot versus bench and pilot). The decision to perform pilot testing shall be made as early in the process as possible to minimize potential delays.

TASK II - REMEDIAL DESIGN

Remedial Design shall be performed to support the response actions selected in the ROD. The Remedial Design shall provide the technical details for implementation of the Remedial Action in accordance with standard professional engineering and construction practices. The design shall include clear and comprehensive design plans and specifications.

A. Remedial Design Planning

At the conclusion of the project planning phase, the Settling Defendant shall submit the following:

- RD Work Plan,
- Sampling and Analysis Plan,
- Health and Safety Plan, and
- Treatability Study Work Plan.

The RD Work Plan, Sampling and Analysis Plan, and Treatability Study Work Plan must be reviewed and approved and the Health and Safety Plan reviewed by EPA prior to the initiation of field activities.

Upon approval of the RD Work Plan, the Settling Defendant shall implement the RD Work Plan in accordance with the EPA-approved design management schedule contained therein. Such implementation shall include EPA review and/or approval of plans, specifications, submittals, and other deliverables. The purpose of these design reviews is for EPA to assess the feasibility of the design to achieve the Site Objectives in accordance with the ROD and Consent Decree, including this SOW. Review and/or approval of design submittals only allows the Settling Defendants to proceed to the next step of the design process. It does not imply acceptance of later design submittals that have not been reviewed, nor that the remedy, when constructed, will meet performance standards and be accepted.

1. RD Work Plan

A Work Plan documenting the decisions and evaluations completed during the scoping process shall be submitted to EPA for review and approval. The Work Plan shall include a comprehensive description of the additional data collection and evaluation activities to be performed, if any, and the plans and specifications to be prepared. A comprehensive design management schedule for completion of each major activity and submission of each deliverable shall also be included. The Work Plan shall be developed in conjunction with the Health and Safety Plan, the Sampling and Analysis Plan, and the Treatability Study Work Plan, although each plan may be delivered under separate cover.

Specifically, the Work Plan shall present the following:

- a. A statement of the problem(s) and potential problem(s) posed by the Site and how the objectives of the RD/RA will address the problem(s).
- b. A background summary setting forth the following:
 - 1) A brief description of the Site including the geographic location, and a description of the physiographic, hydrologic, geologic, demographic, ecological, cultural and natural resource features of the Site;
 - 2) A brief synopsis of the history of the Site including a summary of past disposal practices and a description of previous responses that have been conducted by local, State, Federal, or private parties at the Site;
 - 3) A summary of the existing data in terms of physical and chemical characteristics of the contaminants identified and their distribution among the environmental media at the Site.

A brief list and detailed description of the tasks to be performed, information needed for each task, information to be produced during and at the conclusion of each task, and a description of the work products that shall be submitted to EPA. This includes the deliverables set forth in the remainder of Task II and Task III A.

- d. A schedule with specific dates for completion of each required activity and submission of each deliverable required by this Consent Decree, including those in this SOW. This schedule shall also include information regarding timing, initiation and completion of all critical path milestones for each activity and/or deliverable.
- e. A project management plan, including a data management plan, monthly reports to EPA, and meetings and presentations to EPA at the conclusion of each major phase of the RD/RA. The data management plan shall address the requirements for project management systems, including tracking, storing, and retrieving the data along with identifying software to be used, minimum data requirements, data format and backup data management. The plan shall address both data management and document control for all activities conducted during the RD/RA.
- f. A description of the community relations support activities to be conducted during the RD. The EPA has the lead responsibility for community relations. However, the Settling Defendant shall perform the following community

relations activities under the oversight of the EPA:

1) Participation in public meetings 2) Preparation of Fact Sheets 3) Other activities as necessary to disseminate information to the community.

2. Health and Safety Plan

A Health and Safety Plan shall be prepared in conformance with the Settling Defendant's health and safety program, and in compliance with OSHA regulations and protocols. The Health and Safety Plan shall include a health and safety risk analysis, a description of monitoring and personal protective equipment, medical monitoring, and site control. Note that EPA does not "approve" the Settling Defendant's Health and Safety Plan, but rather EPA reviews it to ensure that all necessary elements are included, and that the plan provides for the protection of human health and the environment.

3. Sampling and Analysis Plan

The Settling Defendant shall prepare a Sampling and Analysis Plan (SAP) to ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and that the data generated will meet the DQOs established. The SAP shall consist of a Field Sampling and Analysis Plan (FSAP) and a Quality Assurance Project Plan (QAPP).

The FSAP shall define in detail the sampling and data-gathering methods that shall be used on the project. It shall include sampling objectives, sample location (horizontal and vertical) and frequency, sampling equipment and procedures, and sample handling and analysis. The Field Sampling and Analysis Plan shall be written so that a field sampling team unfamiliar with the site would be able to gather the samples and field information required. The QAPP shall describe the project objectives and organization, functional activities, and quality assurance and quality control (QA/QC) protocols that shall be used to achieve the desired DQOs. The DQOs shall, at a minimum, reflect use of analytical methods for identifying contamination and addressing contamination consistent with the levels for remedial action objectives identified in the National Contingency Plan. In addition, the QAPP shall address personnel qualifications, sampling procedures, sample custody, analytical procedures, and data reduction, validation, and reporting. These procedures must be consistent with the Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual, May 1996.

The Settling Defendant shall demonstrate, in advance and to EPA's satisfaction, that each laboratory it may use is qualified to conduct the proposed work. This includes use of methods and analytical protocols for the chemicals of concern in the media of interest within detection and quantification limits consistent with both QA/QC procedures and DQOs approved by EPA in the QAPP for the Site. The laboratory must have and follow an approved QA program. The Settling Defendant shall provide assurances that EPA has access to laboratory personnel, equipment and records for sample collection, transportation, and analysis. The Settling Defendants shall submit detailed information to demonstrate that the laboratory is qualified to conduct the work, including information on personnel qualifications, equipment and material specifications. In addition, EPA may require submittal of data

packages equivalent to those generated in the EPA Contract Laboratory Program (CLP) and may require laboratory analysis of performance samples (blank and/or spike samples) in sufficient number to determine the capabilities of the laboratory. If a laboratory not in the CLP is selected, methods consistent with CLP methods that would be used at this Site for the purposes proposed and QA/QC procedures approved by EPA shall be used. In addition, if the laboratory is not in the CLP program, a laboratory QA program must be submitted for EPA review and approval.

4. Treatability Study Work Plan

The Settling Defendant shall prepare a Treatability Study Work Plan for EPA review and approval. This Plan shall describe the remedial technology to be tested, test objectives, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety, and residual waste management. The DQOs for the Treatability Study shall be documented as well. If a pilot-scale Treatability Study is to be performed, the Treatability Study Work Plan shall also describe pilot plant installation and start-up, pilot plant operation and maintenance procedures, and operating conditions to be tested. If testing is to be performed off-site, permitting requirements must be addressed. A schedule for performing the Treatability Studies shall be included with specific dates for the tasks, including, but not limited to, the procurement of contractors and the completion of sample collection, performance, sample analysis, and report preparation.

5. Treatability Study Sampling and Analysis Plan

If the SAP is not adequate for defining the activities to be performed during the Treatability Study, a separate Treatability Study SAP shall be prepared by the Settling Defendants for EPA review and approval. It shall be designed to monitor pilot plant performance.

6. Treatability Study Health and Safety Plan

If the Health and Safety Plan is not adequate for defining the activities to be performed during the Treatability Study, a separate Treatability Study Health and Safety Plan shall be developed by the Settling Defendant. Note that EPA does not "approve" the Settling Defendant's Treatability Study Health and Safety Plan, but rather EPA reviews it to ensure that all necessary elements are included, and that the plan provides for the protection of human health and the environment.

B. Preliminary Design

Preliminary Design begins with initial design and ends with the completion of approximately 30 percent of the design effort. At this stage the Settling Defendant shall have field verified, as necessary, the existing conditions of the Site. The Preliminary Design shall reflect a level of effort such that the technical requirements of the project have been addressed and outlined so that they

may be reviewed to determine if the final design will provide an operable and usable remedial project. Supporting data and documentation shall be provided with the design documents defining the functional aspects of the project to prove that the completed project will be effective in meeting the remediation goals and ARARs. The Settling Defendant shall submit the 30 percent design submittal to the EPA for preliminary review and verbal approval. Upon receiving verbal approval and preliminary comments from the EPA, the Settling Defendant may proceed with the design. Concurrently, the EPA and other stakeholders will review the 30 percent submittal and provide more detailed, written review comments to the Settling Defendant. These comments may include requests to make appropriate modifications to the 30 percent design. The Preliminary Design shall include the results of additional data acquisition activities, if required, a Treatability Study Evaluation Report, a Design Criteria Report, preliminary plans and specifications, a Project Delivery Strategy, and a Plan for Satisfying Permitting Requirements. In accordance with the design management schedule established in the approved Remedial Design Work Plan, the Settling Defendants shall submit to EPA the Preliminary Design submittal which shall consist of the following:

1. Results of Data Acquisition Activities

Data gathered during the project planning phase shall be compiled, summarized, and submitted along with an analysis of the impact of the results on design activities. In addition, surveys conducted to establish topography, rights-of-way, easements, and utility lines shall be documented. Utility requirements and acquisition of access, through purchases or easements, that are necessary to implement the RA shall also be discussed.

2. Design Criteria Report

The concepts supporting the technical aspects of the design shall be defined in detail and presented in this report. Specifically, the Design Criteria Report shall include but not be limited to the following preliminary design assumptions and parameters:

- a. Soil/pond material characterization
- b. Volume of material requiring stabilization/solidification
- c. Volume of material requiring consolidation
- d. Capping and cover requirements
- e. Long range monitoring
- f. Removal of slag and other contaminants along the shoreline, restoration of shoreline and affected portions of Meyers cove and the Anclote River

3. Preliminary Plans and Specifications

The Settling Defendant shall submit an outline of the required drawings, including preliminary sketches and layouts, describing conceptual aspects of the design, unit processes, etc. In addition, an outline of the required specifications, including performance standards, ARARs, etc., shall be submitted. The initiation of the construction drawings shall reflect organization and clarity. The scope of the technical specifications shall be outlined in a manner reflecting the final specifications.

4. Plan for Satisfying Permitting Requirements

The final design plans and specifications must be consistent with the technical requirements of all applicable or relevant and appropriate requirements unless a waiver has been issued. Any off-site disposal shall be in compliance with the policies stated in the Procedure for Planning and Implementing Off-site Response Actions (Federal Register, Volume 50, Number 214, November 1985, pages 45933-45937) and other applicable guidances.

The plan shall identify the off-site disposal/discharge permits that are required, the time required to process the permit applications, and a schedule for submittal of the permit applications.

5. Treatability Study Evaluation Report

Following completion of Treatability Studies, the Settling Defendant shall analyze and interpret the testing results in a technical report to EPA. Depending on the sequence of activities, this report may be submitted with the Preliminary Design or as a separate deliverable, as approved in the RD Work Plan. The report shall evaluate the treatment technology's effectiveness, implementability, cost, and actual results as compared with predicted results. The report shall also evaluate full-scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

C. Intermediate Design

The Intermediate Design ends with the completion of approximately 60 percent of the design effort. The Intermediate Design submittal shall consist of a continuation and expansion of the Preliminary Design submittal as may be modified by any value engineering recommendations adopted by Settling Defendant. The format and extent of the Intermediate Design submittal shall be at the sole discretion of the EPA. For example, the 60% design submittal may consist of only a progress meeting, or it may consist of a complete submission of construction documents. The EPA shall notify the Settling Defendant of the required submittal format, no later than forty five (45) days prior to the scheduled Intermediate Design submittal date. Any value engineering recommendations adopted by Settling Defendant shall be summarized in a report submitted with the Intermediate Design. EPA review comments on the Intermediate Design shall be reflected in the Prefinal/Final Design. The Intermediate Design submittal shall be submitted in accordance with the approved design management schedule and shall consist of the following:

1. Draft Design Analyses

The evaluations conducted to select the design approach shall be described. Design calculations shall be included.

2. Draft Plans and Specifications

Draft construction drawings and specifications for all components of the Remedial Action

shall be prepared and presented. Plans and specifications shall conform to acceptable standards of good practice and shall be formatted in accordance with the requirements of the Construction Specification Institute.

3. Draft Construction Schedule

The Settling Defendant shall develop a Draft Construction Schedule for construction and implementation of the remedial action which identifies timing for initiation and completion of all critical path tasks. The Settling Defendants shall specifically identify dates for completion of the project and major milestones.

D. Prefinal/Final Design

The Settling Defendant shall submit the Prefinal Design when the work is approximately 90 percent complete in accordance with the approved design management schedule. The Prefinal Design shall have addressed comments generated from the Intermediate Design Review and clearly show any modification of the design as a result of incorporation of the comments. The Prefinal Design shall function as the draft version of the Final Design. After EPA review and comment on the Prefinal Design, the Final Design shall be submitted. All Final Design documents shall be certified by a Professional Engineer registered in the State of Florida. EPA approval of the Final Design is required before initiating the RA, unless specifically authorized by EPA. The following items shall be submitted as part of the Prefinal/Final Design:

1. Complete Design Analyses

The selected design shall be presented along with an analysis supporting the design approach. Design calculations shall be included.

2. Complete Plans and Specifications

A complete set of construction drawings and specifications shall be submitted at the Prefinal stage which describe the selected design. The final submittal shall include a complete set of construction drawings and specifications as well as a set of one-half size reductions of the drawings.

3. Final Construction Schedule

4. Construction Cost Estimate

A detailed construction cost estimate (accurate to within +15 percent to -10 percent) shall be submitted.

TASK III - REMEDIAL ACTION

Remedial Action shall be performed to implement the response actions selected in the ROD. The Remedial Action shall consist of all activities necessary to implement the response actions selected

in the ROD prior to operation and maintenance and long-term performance monitoring activities.

A. Remedial Action Planning

Within 45 days after approval of the final design, the Settling Defendant shall submit the following:

- RA Work Plan,
- Construction Management Plan,
- Construction Quality Assurance Plan, and
- Construction Health and Safety Plan/Contingency Plan.

The RA Work Plan, Construction Management Plan, and Construction Quality Assurance Plan must be reviewed and approved and the Construction Health and Safety Plan/Contingency Plan reviewed by EPA prior to the initiation of the Remedial Action.

Upon approval of the RA Work Plan and the Final Design, the Settling Defendants shall implement the RA Work Plan in accordance with the construction management schedule. Significant "field" changes to the RA as set forth in the RA Work Plan and Final Design shall not be undertaken without the approval of EPA. The RA shall be documented in enough detail to produce "as-built" construction drawings certified by a Professional Engineer or Geologist registered in the State of Florida after the RA is complete. Implementation of the RA shall include EPA review and/or approval of required deliverables. The purpose of these reviews is for EPA to assess the feasibility of the project to achieve the Site Objectives in accordance with the ROD and Consent Decree, including this SOW. Review and/or approval of submittals does not imply acceptance of later submittals that have not been reviewed, nor that the remedy, when constructed, will meet performance standards and be accepted.

1. RA Work Plan

A Work Plan which provides a detailed plan of action for completing the RA activities shall be submitted to EPA for review and approval. The objective of this work plan is to provide for the safe and efficient completion of the RA. The Work Plan shall include a comprehensive description of the work to be performed and a construction management schedule for completion of each major activity and submission of each deliverable. The Work Plan shall be developed in conjunction with the Construction Management Plan, the

Construction Quality Assurance Plan, and the Construction Health and Safety Plan/Contingency Plan, although each plan may be delivered under separate cover.

Specifically, the Work Plan shall present the following:

- a. A detailed description of the tasks to be performed and a description of the work products to be submitted to EPA. This includes the deliverables set forth in the remainder of Task III.
- b. A schedule for completion of each required activity and submission of each deliverable required by this Consent Decree, including those in this SOW.
- c. A project management plan, including monthly reports to EPA and meetings and presentations to EPA at the conclusion of each major phase of the RA.
- d. A description of the community relations support activities to be conducted during the RA. At EPA's request, it is expected that the Settling Defendant will assist EPA in preparing and disseminating information to the public regarding the RA work to be performed.
- e. A description of Settling Defendant's strategy for delivering the project. This description shall focus on the management approach to carry out the design and implement the Remedial Action. Items to be addressed include procurement method and contracting strategy, phasing alternatives, and contractor and equipment availability concerns. If the construction of the selected remedy is to be accomplished by Settling Defendant's "in-house" resources, these resources shall be identified.

2. Construction Management Plan

A Construction Management Plan shall be developed to indicate how the construction activities are to be implemented and coordinated with EPA during the RA. The Settling Defendant shall designate a person to be a Remedial Action Coordinator and their representative on-Site during the Remedial Action. This plan shall identify this representative along with other key project management personnel and lines of authority as well as provide descriptions of the duties of the key personnel along with an organizational chart. In addition, a plan for the administration of construction changes and EPA review and approval of those changes shall be included.

3. Construction Quality Assurance Plan

Settling Defendant shall develop and implement a Construction Quality Assurance Program to ensure, with a reasonable degree of certainty, that the completed remedial action meets or exceeds all design criteria, plans and specifications, and Site Objectives. The Construction

Quality Assurance Plan shall incorporate relevant areas of the Remediation Goal Verification Plan (see Task V). At a minimum, the Construction QA plan shall include the following elements:

- a. A description of the quality control organization, including a chart showing lines of authority, identification of the members of the Independent Quality

Assurance Team (IQAT), and acknowledgment that the IQAT will implement the control system for all aspects of the work specified and shall report to the project coordinator and EPA. The IQAT members shall be representatives from testing and inspection organizations and/or the Supervising Contractor and shall be responsible for the QA/QC of the RA. The members of the IQAT shall have a good professional and ethical reputation, previous experience in the type of QA/QC activities to be implemented, and demonstrated capability to perform the required activities. They shall also be independent of the construction contractor.

- b. The name, qualifications, duties, authorities, and responsibilities of each person assigned a QC function.
- c. Documentation of the observations and control testing that will be used to monitor the construction and/or installation of the components of the remedial action. This includes information which certifies that personnel and laboratories performing the tests are qualified and the equipment and procedures to be used complies with applicable standards. Any laboratories to be used shall be specified. Acceptance/Rejection criteria and plans for implementing corrective measures shall be addressed.
- d. A schedule for managing submittals, testing, inspections, and any other QA function (including those of contractors, subcontractors, fabricators, suppliers, purchasing agents, etc.) that involves assuring quality workmanship, verifying compliance with the plans and specifications, or any other QC objectives. Inspections shall also verify compliance with all environmental requirements and include, but not be limited to, air quality and emissions monitoring records and waste disposal records, etc.
- e. Reporting procedures and reporting format for QA/QC activities including such items as daily summary reports, schedule of data submissions, inspection data sheets, problem identification and corrective measures reports, evaluation reports, acceptance reports, and final documentation.
- f. A list of definable features of the work to be performed. A definable feature of work is a task which is separate and distinct from other tasks and has separate control requirements.

4. Construction Health and Safety Plan/Contingency Plan

A Construction Health and Safety Plan/Contingency Plan shall be prepared in conformance with the Settling Defendant's health and safety program, and in compliance with OSHA regulations and protocols. The Construction Health and Safety Plan shall include a health and safety risk analysis, a description of monitoring and personal protective equipment,

medical monitoring, and site control. Note that EPA does not "approve" the Settling Defendant's' Construction Health and Safety Plan/Contingency Plan, but rather EPA reviews it to ensure that all necessary elements are included, and that the plan provides for the protection of human health and the environment. This plan shall include a Contingency Plan and incorporate Air Monitoring and Spill Control and Countermeasures Plans, if applicable for the site. Air monitoring will be necessary at any site when the site specific risk assessment specifies a risk via the inhalation/air transport pathway. The Contingency Plan is to be written for the on-Site construction workers and the local affected population. It shall include the following items:

- a. Name of Person who will be responsible in the event of an emergency incident.
- b. Plan for initial safety indoctrination and training for all employees, name of the person who will give the training and the topics to be covered.
- c. Plan and date for meeting with the local community, including Local, State and Federal agencies involved in the remediation, as well as the local emergency squads and the local hospitals.
- d. A list of the first aid and medical facilities including: location of first aid kits, names of personnel trained in first aid, a clearly marked map with the route to the nearest medical facility, all necessary emergency phone numbers conspicuously posted at the job site (i.e., fire, rescue, local hazardous material teams, National Emergency Response Team, etc.)
- e. Plans for protection of public and visitors to the job site.
- f. Air Monitoring Plan which addresses the following factors:
 - 1) Air monitoring shall be conducted both on site and at the perimeter of the site. The chemical constituents that were identified at the site as part of the Risk Assessment shall serve as a basis of the sampling for and measurement of pollutants in the atmosphere.
 - 2) Air monitoring shall include personnel monitoring, on-Site area monitoring, and perimeter monitoring.
 - a) Personnel Monitoring shall be conducted according to OSHA and NIOSH regulations and guidance.
 - b) On-Site Area Monitoring shall consist of continuous real-time monitoring performed immediately adjacent to any waste excavation areas, treatment areas, and any other applicable areas when work is occurring. Measurements shall be taken in the breathing zones of personnel and immediately upwind and downwind to the work areas.

The Settling Defendant shall submit their proposed type and frequency of air monitoring (i.e. periodic or continuous) for the various contaminants present at the site, for EPA approval. Types of monitoring include (but not be limited to) the following: Organic Vapor Meter, Explosion Meter, Particulate Monitoring Equipment, and On-Site Windsack.

c) Perimeter Monitoring shall consist of monitoring airborne contaminants at the perimeter of the site to determine whether harmful concentrations of toxic constituents are migrating off-site. EPA approved methods shall be used for sampling and analysis of air at the site perimeter. Perimeter samples shall be sampled and analyzed for the constituents of concern identified in the risk assessment. The results of the perimeter air monitoring and the on-Site meteorological station shall be used to assess the potential for off-site population exposure to toxic materials. The air monitoring program shall include provisions for notifying nearby residents, Local, State and Federal agencies in the event that emissions of detectable concentrations of airborne toxic constituents are migrating off-site.

g. A Spill Control and Countermeasures Plan which shall include the following:

1) Contingency measures for potential spills and discharges from materials handling and/or transportation.

2) A description of the methods, means, and facilities required to prevent contamination of soil, water, atmosphere, uncontaminated structures, equipment, or material by the discharge of wastes from spills due to operations.

3) A description of the equipment and personnel necessary to perform emergency measures required to contain any spillage and to remove spilled materials and soils or liquids that become contaminated due to spillage. This collected spill material must be properly disposed of.

4) A description of the equipment and personnel to perform decontamination measures that may be required to remove spillage from previously uncontaminated structures, equipment, or material.

B. Preconstruction Conference

A Preconstruction Conference shall be held after selection of the construction contractor but

before initiation of construction. This conference shall include the Settling Defendant and Federal, State and Local government agencies and shall:

1. Define the roles, relationships, and responsibilities of all parties;
2. Review methods for documenting and reporting inspection data;
3. Review methods for distributing and storing documents and reports;
4. Review work area security and safety protocols;
5. Review the Construction Schedule.
6. Conduct a site reconnaissance to verify that the design criteria and the plans and specifications are understood and to review material and equipment storage locations.

The Preconstruction Conference must be documented, including names of people in attendance, issues discussed, clarifications made, special instructions issued, etc.

C. Prefinal Inspection

Upon preliminary project completion the Settling Defendant shall notify EPA for the purpose of conducting a Prefinal Inspection. Participants shall include the Project Coordinators, Supervising Contractor, Construction Contractor, and other Federal, State, and local agencies with a jurisdictional interest. The Prefinal Inspection shall consist of walk through inspection of the entire project site. The objective of the inspection is to determine whether the project is complete and consistent with the Consent Decree. Any outstanding construction items discovered during the inspection shall be identified and noted on a punch list. Additionally, treatment equipment shall be operationally tested by the Settling Defendant. The Settling Defendant shall certify that the equipment has performed to effectively meet the purpose and intent of the specifications. Retesting shall be completed where deficiencies are revealed. A Prefinal Inspection Report shall be submitted which outlines the outstanding construction items, actions required to resolve the items, completion date for the items, and an anticipated date for the Final Inspection.

D. Final Inspection

Upon completion of all outstanding construction items, the Settling Defendant shall notify EPA for the purposes of conducting a Final Inspection. The Final Inspection shall consist of a walk-through inspection of the entire project site. The Prefinal Inspection Report shall be used as a check list with the Final Inspection focusing on the outstanding construction items identified in the Prefinal Inspection. All tests that were originally unsatisfactory shall be conducted again. Confirmation shall be made during the Final Inspection that all outstanding items have been resolved. Any outstanding construction items discovered during the inspection still requiring correction shall be identified and noted on a punch list. If any items are still unresolved, the inspection shall be considered to be a Prefinal Inspection requiring another Prefinal Inspection

Report and subsequent Final Inspection.

E. Remedial Action Report

Within 45 days after the Final Inspection, the Settling Defendant shall prepare and submit a Remedial Action Report which certifies that all items contained in the Consent Decree, including the ROD and this SOW and all incorporated documents (i.e., work plans, reports, plans and specifications, etc.) have been completed and that the remedy is functional and operating and has met the specifications. Such report shall be certified by a Professional Engineer or Geologist registered in the State of Florida. The RA Report shall include the following items:

1. Brief description of how outstanding items noted in the Prefinal Inspection were resolved;
2. Synopsis of the work defined in the SOW and certification that this work was performed;
3. Explanation of modifications made during the RA to the original RD and RA Work Plans and why these changes were made;
4. As-built and Record Drawings; and,
5. Documentation of how the Respondents are implementing the EPA-approved Operation and Maintenance Plan and Remediation Goal Verification Plan.

After EPA review, Settling Defendant shall address any comments and submit a revised report. The Remedial Action shall not be considered complete until EPA approves the RA Report.

TASK IV - OPERATION AND MAINTENANCE

Operation and Maintenance (O&M) shall be performed for projects that produce facilities requiring operation and maintenance to support the response actions selected in the ROD. Operation and Maintenance shall be considered to begin on the date of the RA Report and shall be conducted until the Site Objectives are achieved in accordance with the ROD and Consent Decree.

A. Operation and Maintenance Plan

Concurrent with the submittal of the Prefinal (90 percent) Design, the Settling Defendant shall submit an Operation and Maintenance Plan for review. The Operation and Maintenance Plan shall be revised during the Remedial Action after identification of the specific equipment to be installed by the construction contractor and submitted for review by EPA prior to 50 percent completion of the Remedial Action and initiation of Operation and Maintenance activities.

Upon approval of the Operation and Maintenance Plan, the Settling Defendant shall implement the Operation and Maintenance Plan in accordance with the schedule contained therein. This plan shall describe start-up procedures, operation, troubleshooting, training, and evaluation activities that shall be carried out by the Settling Defendant. This plan shall also include all necessary O&M information for the operating personnel for the anticipated life of the project. The plan shall address the following elements:

1. Equipment start-up and operator training;
 - a. Technical specifications governing treatment systems;
 - b. Requirements for providing appropriate service visits by experienced personnel to supervise the installation, adjustment, start-up and operation of the systems; and,
 - c. Schedule for training personnel on appropriate operational procedures once start-up has been successfully completed.
2. Description of normal operation and maintenance;
 - a. Description of tasks required for system operation;
 - b. Description of tasks required for system maintenance;
 - c. Description of prescribed treatment or operating conditions; and,
 - d. Schedule showing the required frequency for each O&M task.
3. Description of potential operating problems;
 - a. Description and analysis of potential operating problems;
 - b. Sources of information regarding problems; and,
 - c. Common remedies or anticipated corrective actions.
4. Description of routine monitoring and laboratory testing;
 - a. Description of monitoring tasks;
 - b. Description of required laboratory tests and their interpretation;
 - c. Required QA/QC; and,
 - d. Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

5. Description of alternate O&M;
 - a. Should systems fail, alternate procedures to prevent undue hazard, and
 - b. Analysis of vulnerability and additional resource requirements should a failure occur.
6. Safety Plan;
 - a. Description of precautions to be taken and required health and safety equipment, etc., for site personnel protection, and
 - b. Safety tasks required in the event of systems failure.
7. Description of equipment;
 - a. Equipment identification;
 - b. Installation of monitoring components;
 - c. Maintenance of site equipment; and,
 - d. Replacement schedule for equipment and installation components.
8. Records and reporting mechanisms required;
 - a. Daily operating logs;
 - b. Laboratory records;
 - c. Records of operating cost;
 - d. Mechanism for reporting emergencies;
 - e. Personnel and Maintenance Records; and,
 - f. Monthly reports to State/Federal Agencies.

TASK V - PERFORMANCE MONITORING

Performance monitoring shall be conducted to ensure that the site objectives for the remedy are met.

A. Remediation Goal Verification Plan

The purpose of the Remediation Goal Verification Plan is to provide a mechanism to ensure that both short-term and long-term performance standards for the Remedial Action are being met. Guidances used in developing the Sampling and Analysis Plan during the Remedial Design phase shall be used. The Remediation Goal Verification Plan shall be submitted with the RA Work Plan. Once approved, the Remediation Goal Verification Plan shall be implemented on the approved schedule. The Remediation Goal Verification Plan consists of two parts:

1. The Remediation Goal Verification Field Sampling and Analysis Plan that provides guidance for all fieldwork by defining in detail the sampling and data gathering methods to be used on a project. The Verification Field Sampling and Analysis Plan shall be written so that a field sampling team unfamiliar with the site would be able to gather the samples and field information required.
2. The Remediation Goal Verification Quality Assurance/Quality Control plan that describes the policy, organization, functional activities, and quality assurance and quality control protocols necessary to achieve the performance standards set forth in the Record of Decision and the Remedial Design plans and specifications.

B. Five Year Review

Because the selected remedy will leave residual levels of hazardous constituents on-Site, EPA shall conduct a Five Year Review to ensure that the remedy has reached the goal of being protective of human health and the environment. The time period for the five year review shall start on the day of the Preconstruction Meeting.

REFERENCES

The following list, although not comprehensive, comprises many of the regulations and guidance documents that apply to the RD/RA process:

1. "National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule", Federal Register 40 CFR Part 300, March 8, 1990.
2. "Superfund Remedial Design and Remedial Action Guidance", U.S. EPA, Office of Emergency and Remedial Response, June 1986, OSWER Directive No. 9355.0-4A.
3. "Interim Final Guidance on Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties", U.S. EPA, Office of Emergency and Remedial Response, February 14, 1990, OSWER Directive No. 9355.5-01.
4. "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final", U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive No. 9355.3-01.
5. "A Compendium of Superfund Field Operations Methods", Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.
6. "EPA NEIC Policies and Procedures Manual", EPA-330/9-78-001-R, May 1978, revised November 1984.
7. "Data Quality Objectives for Remedial Response Activities", U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335.0-7B.
8. "Guidelines and Specifications for Preparing Quality Assurance Project Plans", U.S. EPA, Office of Research and Development, Cincinnati, OH, QAMS-004/80, December 29, 1980.
9. "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans", U.S. EPA, Office of Emergency and Remedial Response, QAMS-005/80, December 1980.
10. "Users Guide to the EPA Contract Laboratory Program", U.S. EPA, Sample Management Office, August 1982.
11. "Environmental Investigations Standard Operating Procedures and Quality Assurance Manual," U.S. EPA Region IV, May 1996
12. "USEPA Contract Laboratory Program Statement of Work for Organic Analysis", U.S. EPA, Office of Emergency and Remedial Response, February 1988.

13. "USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis", U.S. EPA, Office of Emergency and Remedial Response, July 1988.
14. "Quality in the Constructed Project: A Guideline for Owners, Designers, and Constructors, Volume 1, Preliminary Edition for Trial Use and Comment", American Society of Civil Engineers, May 1988.
15. "Interim Guidance on Compliance with Applicable or Relevant and Appropriate Requirements", U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.
16. "CERCLA Compliance with Other Laws Manual", Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (Draft), OSWER Directive No. 9234.1-01 and -02.
17. "Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites", U.S. EPA, Office of Emergency and Remedial Response, (Draft), OSWER Directive No. 9283.1-2.
18. "Guide for Conducting Treatability Studies Under CERCLA", U.S. EPA, Office of Emergency and Remedial Response, Pre-publication Version
19. "Health and Safety Requirements of Employees Employed in Field Activities", U.S. EPA, Office of Emergency and Remedial Response, July 12, 1981, EPA Order No. 1440.2.
20. "Standard Operating Safety Guides", U.S. EPA, Office of Emergency and Remedial Response, November 1984.
21. "Standards for General Industry", Federal Register 29 CFR Part 1910, Occupational Health and Safety Administration.
22. "Standards for the Construction Industry", Federal Register 29 CFR 1926, Occupational Health and Safety Administration.
23. "NIOSH Manual of Analytical Methods, 2d edition. Volumes I-VII, or the 3rd edition, Volumes I and II, National Institute of Occupational Safety and Health.
24. "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities", National Institute of Occupational Safety and Health/Occupational Health and Safety Administration/United States Coast Guard/Environmental Protection Agency, October 1985.
25. "TLVs - Threshold Limit Values and Biological Exposure Indices for 1987-88", American Conference of Governmental Industrial Hygienists.
26. "American National Standards Practices for Respiratory Protection", American National Standards Institute Z88.2-1980, March 11, 1981.

27. "Procedures for Completion and Deletion of NPL Sites", U.S. EPA, Office of Emergency and Remedial Response, April 1989, OSWER Directive No. 9320.2-3A.

**SUMMARY OF THE MAJOR DELIVERABLES
FOR THE REMEDIAL DESIGN AND REMEDIAL ACTION
AT THE STAUFFER CHEMICAL/TARPON SPRINGS SUPERFUND SITE**
DELIVERABLE **EPA RESPONSE**

TASK I

SCOPING

Technical Memorandum Documenting
Any Revised Site Objectives (5)

Review and Approve

TASK II

REMEDIAL DESIGN

RD Work Plan (15)

Review and Approve

Sampling and Analysis Plan (15)

Review and Approve

Health and Safety Plan (5)

Review and Comment

Treatability Study Work Plan (15)

Review and Approve

Treatability Study Sampling and
Analysis Plan (15)

Review and Approve

Treatability Study Health and
Safety Plan (5)

Review and Comment

Preliminary Design

Results of Data Acquisition
Activities (10)

Review and Approve

Design Criteria Report (10)

Review and Approve

Preliminary Plans and
Specifications (10)

Review and Approve

Plan for Satisfying Permit
Requirements (10)

Review and Approve

Treatability Study Evaluation
Report (10)

Review and Approve

Intermediate Design

Draft Design Analyses (10)

Review and Comment

Draft Plans and Specifications (10) (As instructed by EPA)	Review and Comment
Draft Construction Schedule	Review and Comment
Prefinal/Final Design	
Complete Design Analyses (10)	Review and Approve
Complete Plans and Specifications (10)	Review and Approve
Final Construction Schedule (10)	Review and Approve
Construction Cost Estimate (5)	Review and Comment

TASK III REMEDIAL ACTION

RA Work Plan (15)	Review and Approve
Project Delivery Strategy (10)	Review and Approve
Construction Management Plan (10)	Review and Approve
Construction Quality Assurance Plan (10)	Review and Approve
Construction Health and Safety Plan/Contingency Plan (5)	Review and Comment
Prefinal Inspection Report (5)	Review and Comment
Remedial Action Report (10)	Review and Approve

TASK IV OPERATION AND MAINTENANCE

Operation and Maintenance Plan (10)	Review and Approve
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TASK V PERFORMANCE MONITORING

Remediation Goal Verification Plan (15)	Review and Approve
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Note: The number in parenthesis indicates the number of copies to be submitted by Respondents.

One copy shall be unbound, the remainder shall be bound. The reviews, approvals, and comment will be documented by letters from the EPA Remedial Project Manager.